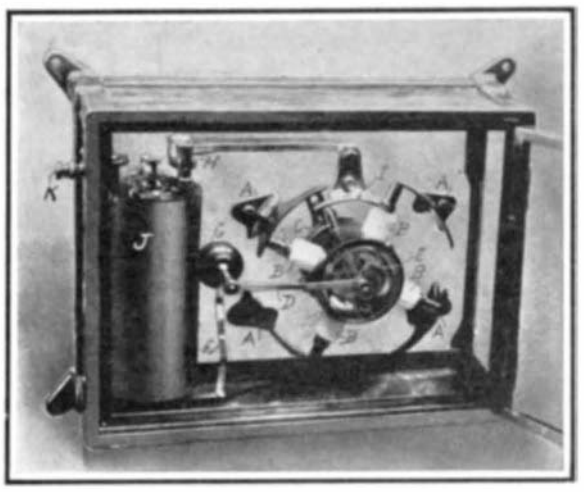
### NEW SPRING WHEELS.

(*Continued from page 36.*)

tire will run from 10,000 to 12,000 miles upon fairly good roads without needing repairs. The weight of the Guigner wheel is from 70 to 100 pounds, according to the size, and at present it is made in 30 to 38-inch sizes.

Another interesting effort to grapple with the problem of obviating the disadvantages inherent in pneumatic tires is the invention of Mr. George Middleton, of London. In this device, instead of the wheel rims being shod with pneumatic tires, the air cushion is inserted round the hub of the wheel, so that the wheel proper has no rigid connection with the axle or driving medium. This device has been thoroughly tested with a 15-horse-power Panhard car, the wheels of which



A NOVEL DASHBOARD IGNITION OUTFIT.

were fitted with it and shod with solid tires. Over 15,000 miles have been covered, and the system has proved fairly successful. The degree of resiliency is of course not equal to that of pneumatic tires, but it has the surety that a puncture is a very remote possibility. Should, however, the air cushion break down, the car can still be safely run to its destination where the defective tube can be repaired. Access to the tube can be effected quickly and easily since the outer flange is made removable for this purpose. Several high-powered cars have already had this pneumatic hub fitted to the driving wheels, so that the latter can be shod with. solid tires, and the conversion has proved completely successful.

A wheel having a hub somewhat similar to the above-described wheel, but in which the hub is supported on springs instead of on a pneumatic tube, is also shown at the bottom of page 36. This wheel is provided with a solid tire put on in sections, which are held to the rim by special binding screws. The arrangement is a compact one and it has a very neat appearance.

A somewhat more complicated wheel, designed for a like purpose, consists of a hub tied by tangent spokes

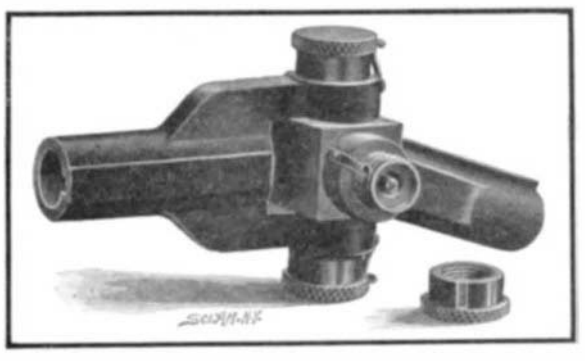


Fig. 1.--UNIVERSAL JOINT ASSEMBLED.

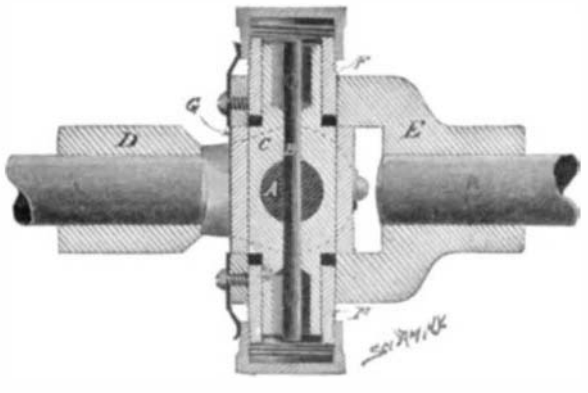


Fig. 2.—SECTION THROUGH JOINT.

to a ring surrounded by an annular coiled spring, and situated within the rim of the wheel. This ring is straddled by twelve radial rods connecting the rim of the wheel with a metal ring surrounding the hub, and these rods also have coiled springs acting under compression. The inner ring having the annular coiled spring may be considered an inner driving wheel, for as the axle begins to turn, the spring is compressed against the radial rods or spokes, thereby giving a spring-drive to the rim. The straight coiled springs which run to the rim act as shock absorbers or spring cushions which take the place of pneumatic tires.

### Roman Antiquities Discovered in London.

Another section of the ancient Roman wall has been brought to light during the construction of a factory in the City of London. The unearthed relic measures 20 feet in length by 7 feet in height. Owing to its extreme antiquarian interest, the wall is not to be demolished, but is to be left in position, the new factory being built around it. It will then project about three feet into one of the rooms on the lower ground floor. To protect the wall from crumbling under the vibration of machinery and other causes, it is to be inclosed in a galvanized-iron netting similar to that around the Roman remains at the London Coal Exchange. In the course of other excavations upon the site for a fire station in Cannon Street, a Roman bath was unearthed. The relic is in a perfect state of preservation and is quite complete. It measures inside 10 feet 6 inches in length by 6 feet 3 inches wide, and weighs about seven tons. This monument has been removed intact, and will eventually be placed in a museum.

### A DASHBOARD IGNITION OUTFIT.

In the Mosler ignition device, illustrated herewith, all parts of the electric system of an automobile except the batteries, spark plugs and connecting wires, are carried in a brass-framed glass case attached to the dashboard. The case contains the coil, a primary interrupter, and a secondary distributor, and these are always visible, thus permitting adjustments and repairs with little loss of time.

The wire from the batteries connects through the binding post, *K*, with the primary of the coil, *J*, while the other end of this winding is joined through the contact, *H*, with the fixed sector, *I*, on the rear wall of the case, *I* being connected through the brush post, *C*, with the four segments of the primary interrupter. The primary circuit is completed through the grounded shaft and car body to the batteries.

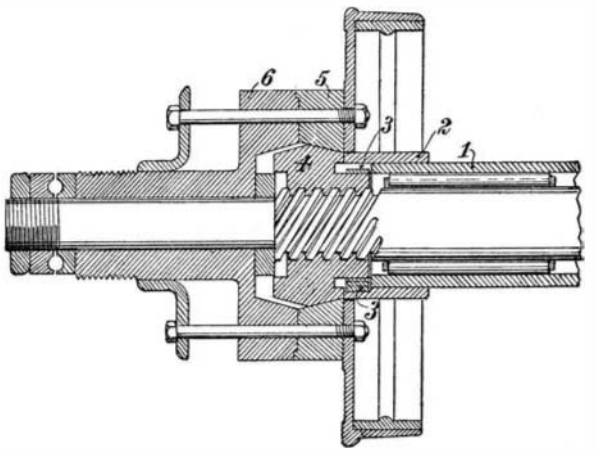
One terminal of the secondary coil winding is grounded through the same post as the primary, while the other connects with a brass strip, *F*, carried by the hard rubber support, *G*. From this the current is carried to a central terminal, *E*, of the distributor by a movable flexible rod, *D*, which is so hinged at the bracket end that it can be swung from the terminal, *E*, to permit the opening of the circuit. The high tension circuit from *E* is through revolving ball contact with the rotating T-shaped brush. The outer ends of the four high-tension terminals which are inclosed in the insulations, *B*, are in direct contact with the four segments, *A*. These are secured to the rear panel of the casing and are connected to the four wires to the spark plugs.

### AN IMPROVED UNIVERSAL JOINT.

A universal joint has recently been invented, which is so designed that it can be taken apart without the use of tools. One of our illustrations shows the complete joint with one of the grease cups removed, while the other is a section which clearly shows the novel construction. It will be observed that the joint comprises a central cubical block, *G*, through which passes a shouldered pin, *C*. A hole is drilled transversely through this pin and the block to receive the pin, *A*. A small locking pin, *B*, passes lengthwise through the pin, *C*, and transversely through pin, *A*, serving to hold them together in proper relative position. The projecting ends of these pins find bearings respectively in the forks, *E* and *D*, which are carried on the two sections of the shaft. Bushings, *F*, are driven into the holes in the forks, and the threaded ends of these bushings carry the grease cups. Spring stops on the forks press against the cups to prevent them from working off the bushing. Packing rings at the bottom of the bushings prevent the escape of the lubricant, which is kept in holes drilled in the ends of the pins, *A* and *C*. When it is desired to take the joint apart, two adjacent grease cups are removed. The pin, *B*, is then removed, permitting the pin, *A*, to drop out, whereupon the joint falls apart.

### WHEEL CLUTCH FOR USE WITH A SOLID REAR AXLE.

Many attempts have been made by inventors to devise some sort of a clutch for use on the rear axle of an automobile, which would do away with the complications and deficiencies of the differential gear. We illustrate herewith a simple clutch which appears to have solved the difficulty. The rear axle turns on roller bearings, carried by the housing, 1. The sleeve, 2, on this housing carries a friction band, 3, which is mounted on the hub of the nut, 4, and is free to move in and out with this nut. The nut engages a thread on the axle. It will be observed that the periphery of the nut is formed with inclined faces adapted to engage one or other of the clutch faces on the hubs, 5 and 6. The illustration shows the nut engaging the "go-ahead" clutch, 5. If, as in rounding a curve, the outer wheel travels faster than the axle, it tends to feed the nut out to a neutral position between the two faces. When the motion of the axle is reversed, the thread feeds the nut back against the clutch, 6, and then again, if the wheel travels faster than the axle, the clutch feeds the nut in far enough to disengage the clutch faces. As a result of this construction, the wheel which is doing the harder work receives more power, whereas with a differential axle the wheel which is doing the less work is favored at the expense of the other. An extreme example is that of a machine equipped with a differential axle standing

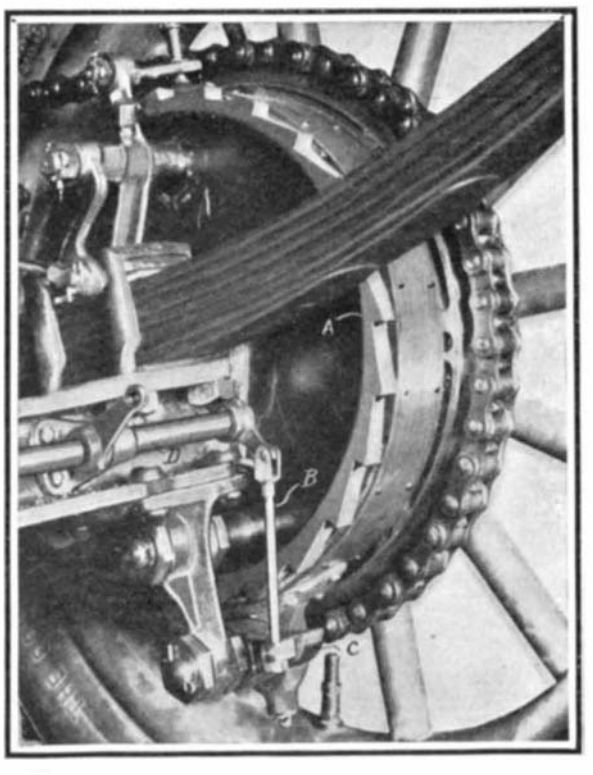



AUTOMATIC WHEEL CLUTCH MAKING POSSIBLE A SOLID LIVE AXLE.

with one wheel on dry pavement and the other on a muddy or wet spot. The latter wheel will spin idly around while the other remains stationary. The improved axle here shown would make both wheels turn at the same speed, expending the greater power on the wheel which engages the dry ground.

### THE THOMAS SAFETY RATCHET DEVICE.

One of the most striking features of the Thomas car is a safety ratchet device arranged on the brake drums of the rear wheels and having for its object the instant stopping of the machine should the brakes fail to hold and the car start to run down hill backward. By the movement of a small lever placed on the dash, the driver rotates the rod, *D*, and, by means of the connection, *B*, draws up the pawl, *C*, against the ratchet-toothed ring, *A*. *C* is held against *A* by means of a spring suitably connected in the system, with the result that if the car is backing, it is instantly brought to a standstill and its passengers are saved from disastrous results. This device is a valuable one, and should be placed on more of the large touring cars, as failure of the brakes in a critical moment is one of the troubles to which such cars are prone. The




THOMAS SAFETY RATCHET DEVICE FOR STOPPING A CAR FROM BACKING DOWN HILL.

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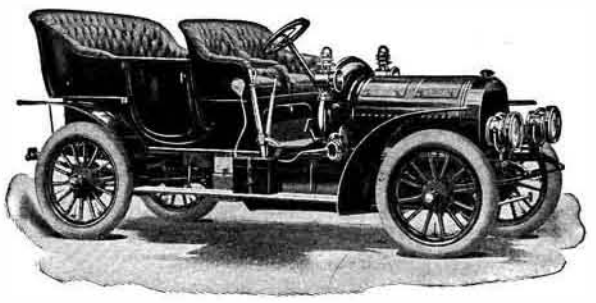

The wonderful motor in each Royal Tourist is exactly the same as the one that ran away from most of the racing cars in the Vanderbilt Elimination Race.

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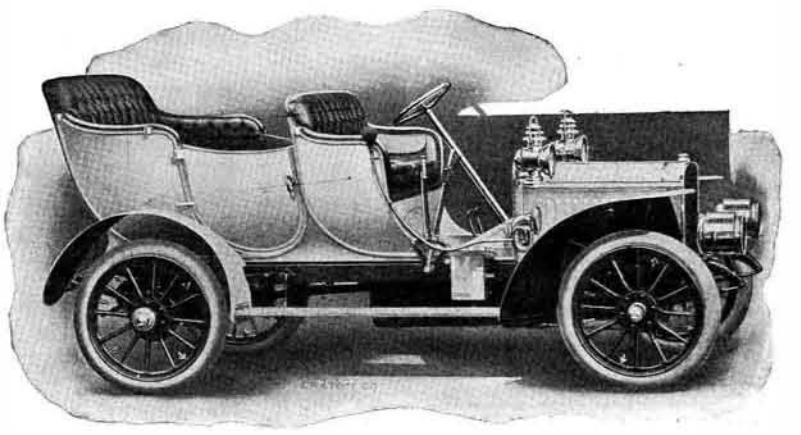

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TULIP BODY FURNISHED IF DESIRED

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The CLEVELAND has real, solid, tested, standing-up ability. The complete chassis is made by the Garford Company—the largest manufacturers of exclusively high grade automobile parts and chassis in America. *It has no weak spots—we guarantee you against them.* Price $3,500 to $5,000, depending upon body equipment.

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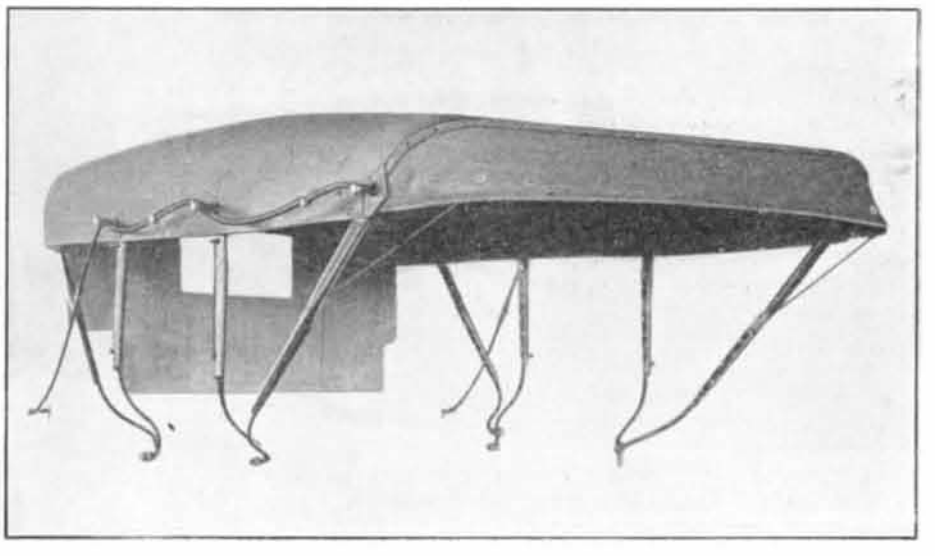

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**The Wright Aeroplane and Its Fabled Performances.**

A Parisian automobile paper recently published a letter from the Wright brothers to Capt. Ferber of the French army, in which statements are made that certainly need some public substantiation from the Wright brothers. In the letter in question it is alleged that on September 26 the Wright motor-driven aeroplane covered a distance of 17.961 kilometers in 18 minutes and 9 seconds, and that its further progress was stopped by lack of gasoline. On September 29 a distance of 19.57 kilometers was covered in 19 minutes and 55 seconds, the gasoline supply again having been exhausted. On September 30 the machine traveled 16 kilometers in 17 minutes and 15 seconds; this time a hot bearing prevented further remarkable progress. Then came some eye-opening records. Here they are:

October 3: 24.535 kilometers in 25 minutes and 5 seconds. (Cause of stoppage, hot bearing.)

October 4: 33.456 kilometers in 33 minutes and 17 seconds. (Cause of stoppage, hot bearing.)

October 5: 38.956 kilometers in 33 minutes and 3 seconds. (Cause of stoppage, exhaustion of gasoline supply.)

It seems that these alleged experiments were made at Dayton, Ohio, a fairly large town, and that the newspapers of the United States, alert as they are, allowed these sensational performances to escape their notice. When it is considered that Langley never even successfully launched his man-carrying machine, that Langley's experimental model never flew more than a mile, and that Wright's mysterious aeroplane covered a reputed distance of 38 kilometers at the rate of one kilometer a minute, we have the right to exact further information before we place reliance on these French reports. Unfortunately, the Wright brothers are hardly disposed to publish any substantiation or to make public experiments, for reasons best known to themselves. If such sensational and tremendously important experiments are being conducted in a not very remote part of the country, on a subject in which almost everybody feels the most profound interest, is it possible to believe that the enterprising American reporter, who, it is well known, comes down the chimney when the door is locked in his face—even if he has to scale a fifteen-story sky-scraper to do so—would not have ascertained all about them and published them broadcast long ago? Why particularly, as is further alleged, should the Wrights desire to sell their invention to the French government for a "million" francs? Surely their own is the first to which they would be likely to apply.

We certainly want more light on the subject.

**AUTOMOBILE SHOCK-ABSORBERS.**

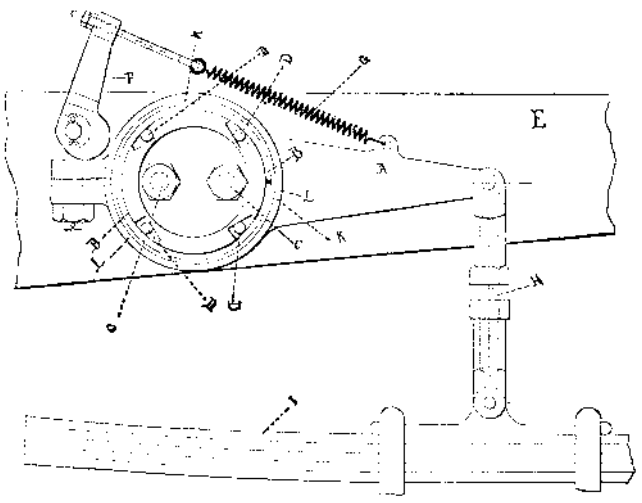
Devices for easing the shock to the springs and checking the rebound of the same are daily becoming more numerous. The original device of this sort was first used on the Richard-Brazier racer, which won the Gordon-Bennett race in 1904. This was the Hartford-Truffault suspension, which has since been widely used on all makes of cars. It consists, in its latest form, of two flat lever arms pivotally attached to the lower part of the spring, where it is clamped to the axle, and to the body respectively. These lever arms terminate in flat disks, which are fastened together by a central bolt, and which clamp a leather washer between them. A five-pronged starwheel on the outside of one disk is used for adjusting the pressure, and is locked in place by a lock nut. The turning motion of the disks on the friction washer, which takes place when the spring is compressed (bringing the two arms together) or when it recoils (throwing the arms apart), produces a braking effect upon the spring, which adds greatly to the easy-riding qualities of the car.

Another form of shock-absorber which has been patented lately consists of a pneumatic pad placed on the axle and having the spring resting upon it. This pad absorbs all the vibrations, and makes it possible to use solid tires on the wheels.

Still another new device for checking the rebound of the spring is shown herewith. The action of this apparatus is as follows:

To the frame of the car is fastened a central disk, by bolts, *C C*. This disk has four cam slots in its periphery, in which are the rollers, *D D D D*. Bearing on these is a steel friction band, *B*, split crosswise to give a certain elasticity as the rollers come and go. Surrounding this band is a fiber band, *K*, which takes the thrust between *B* and the split hub, *L*, of the arm, *A*. The back end of the hub is split and has two extending lugs. Secured in the lower lug is a bolt, which passes freely through the upper lug. Bearing on this lug and pivoted on the bolt is a cam with the upwardly extending arm, *F*, which in turn is connected to the arm, *A*, by the helical spring, *G*. This spring is adjustable in its tension by virtue of the rod passing through *F*. The arm, *A*, is connected by the adjustable rod, *H*, to the spring, *I*, of the car.

When the car goes over a bump, the frame, *E*, moves toward the spring, *I*, and consequently throws up the arm, *A*. This action is without resistance on the part of the device. When the frame and spring tend to separate, however, the four rollers engage with the friction band, *B*, and cause a braking action to take place between the friction band and the fiber band. The tension on the brake is at all times self-adjusting both as to tension and wear, by means of the cam bearing on the upper lug of the split hub and the spring, *G*, the degree of tension being governed by the eyebolt passing through *F*. Thus is obtained a self-

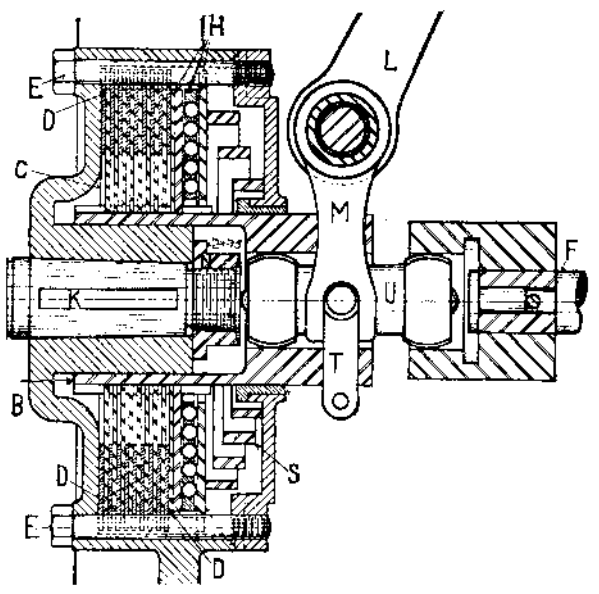



AUTOMOBILE SHOCK-ABSORBER.

adjusting suspension, which only checks the rebound of the spring, allowing it to act without hindrance when deflecting.

**THE FRANKLIN AIR-COOLED CARS.**

The latest type of Franklin machine is a 6-cylinder, 30-horse-power car, fitted with a 3-speed sliding gear transmission and capable of traveling 50 miles an hour. The engine of this car has mechanically-operated inlet and exhaust valves, as well as auxiliary exhaust valves of the same type. The cylinders are of uniform thickness, and the head has been decreased in thickness over that used last year. The inlet and exhaust valve chambers in the top of the cylinders are flanged with radiating ribs. The auxiliary exhaust valve is said to be beneficial in three ways, viz.: It gives a much freer exhaust, which reduces the back pressure and lowers the temperature of the remaining gases; the main exhaust valve is not subjected to such a severe flame, because the pressure in the cylinder has been lowered; and lastly, no carbon deposits form in the combustion chamber, and the cylinders never become fouled through surplus oil. Graphite may be used in the crankcase, if desired. The diagram showing the cross section of the Franklin clutch gives a good idea of a multiple-disk clutch, such as is now being used on many of the leading cars. The disks are of phosphor-bronze and steel, the former, *C*, being prevented from rotating in the flywheel by the bolts, *E*, on which they are mounted so that they have lateral movement. The other disks, *D*, are located between the first set and are fastened to the clutch sleeve, *B*, on which they can move laterally. This sleeve is connected to the transmission shaft by means of the universal joint, *U*. A flat spiral spring, *S*, holds the plates firmly in contact when the clutch is engaged. As the flywheel revolves, it carries with it the first set of disks, *C*, and these also carry along the second




CROSS-SECTION OF THE FRANKLIN CLUTCH.

set of disks, since all are pressed together by the spring, *S*. When the pedal lever, *L*, is moved forward by means of pressure on the clutch pedal, the clutch-shifter lever, *M*, is moved backward, carrying with it the trunnion, *T*, and the clutch sleeve. The latter brings with it the ball thrust bearing, *H*, consisting of three plates, the center one of which contains a large number of balls. This thrust bearing compresses the spring, *S*, relieving the pressure upon the disks, which are now free to move, and which separate sufficiently for the oil from the oil bath in which the clutch runs to fill the space between them. A certain amount of time is taken for the oil to be squeezed out when the disks are thrust together again by the spring, and the result is that the clutch takes hold gradually and without jerk.

**Automobile Notes.**

A comprehensive idea of the proportions of the automobile industry in France may be gathered from the fact that in that country there are twenty large motor car manufactories devoted to the production of automobiles, and their average daily output is two vehicles, representing 14,400 vehicles per annum. To these must be added the output of fifty smaller establishments, which produce on the average 9,000 vehicles per year. France has thus an annual total production of over 23,000 motor car chassis, exclusive of carriage bodies and outfits. A large proportion of this production is exported, some 7,000 annually being sent to England, of which a large percentage is re-exported to the colonies. Other countries are also good customers of this prominent French industry.

The proper degree of inflation of the pneumatic tires for automobiles of large size exercises a far-reaching influence upon the life and durability of the tires. A tire insufficiently inflated is short-lived, owing to the rim of the wheel tending to break the beaded edge of the tire from the tread, while excessive inflation maintains the fabric at such a tension that disintegration of the fabric must inevitably occur very quickly. The correct pressure, according to the most prominent manufacturers, should be in the case of the tires for the front wheels from 70 to 80 pounds per square inch and from 80 to 90 pounds for the rear wheel tires. If this pressure is not adhered to a very severe contracting and expanding action takes place just above the point of contact all the time the tire is rolling over the ground, with the result that enormous friction is set up. This causes considerable heating of the walls of the tire with the results of cracking and bursting. To make sure that the pressure is correct, a good pump with a gage should be used, and it is advisable that the latter should be tested from time to time to insure that it is registering correctly.

Accumulator design has recently experienced a radical change by the appearance on the market of the new "Morrison" storage battery, which is manufactured by the Universal Electric Storage Battery Company, of Chicago. The designers of this battery have departed from accepted practice in an attempt to avoid one of the principal causes of depreciation, viz., the shedding or gradual loss of active material from the positive plates. In so doing, they have not only successfully accomplished the results desired, but in addition have gained a noticeable increase in capacity per unit of weight. These departures from the older and better known designs are embodied in a peculiar construction of positive plate. This is made up of twenty or more horizontal rectangular frames, whose length is equal to the width of the plate and whose width is the same as its thickness, i. e., about ½ inch, while their height is somewhat less. These frames have numerous transverse ribs, the spaces between which are filled with active material, thus making each frame a solid rectangular block. These blocks are assembled one above another with transversely-grooved wood separators of the same size placed between them. Vertical side bars dovetailed and lead burned to them tie them together so as to form a complete plate. The result is a plate of unusual mechanical strength in which the active material is totally inclosed, and consequently the possibility of loss from the plate eliminated. By this construction the manufacturers are able to employ a very high percentage of active material per pound of plate. Complete expansion of active material is assured before the sections are filled, and no mechanical pressure is required to hold the active material in place, as is the case with other forms of pasted plate. The active material is consequently left in a very porous condition, allowing good circulation of the electrolyte. As it is within the plate, and surrounded by the lead grid, the elements of the battery can be assembled with the metallic surfaces of positive and negative plates close together, instead of the active material being on the surface, and the lead in the interior. The internal resistance of the cell is accordingly greatly reduced. The manufacturers of the "Morrison" battery claim for their output absolute retention of the active material, giving durability and continued full capacity; large active surface and great porosity of active material for the action of the electrolyte, giving great ampere capacity per pound; better circulation for the electrolyte; two metallic surfaces opposite each other, giving the lowest internal resistance of any cell; great mechanical strength; entire freedom from buckling. The company have in constant service a great number of their batteries used for train lighting, truck, and automobile work, all of which are said to be giving entire satisfaction.